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Cancer Care Initiative: Creation of a Comprehensive Cancer Center at Naval Medical Center San
Diego

A Graduate Management Project Proposal

Submitted to LT Suzanne J. Wood, Ph.D., MSC, USN,

in Partial Fulfillment of

Requirements for the Degree of Master's in Health Administration

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by

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Abstract

Many cancer centers today focus on providing comprehensive, multidisciplinary care that involves family and friends in the treatments and support services for cancer patients. Wagner's Chronic Care Model is one such model that can be used to provide this system of care to cancer patients. This study examines the historical, developmental, and current aspects of Naval Medical Center San Diego's cancer center, and it uses Wagner's Chronic Care Model to comparatively evaluate it. Their cancer center demonstrates a model that streamlines processes and is capable of increasing quality and access to care through the use of a patient/family-centered model that provides comprehensive, multiservice cancer care and allows more patients to receive primary and supplementary cancer services within a single location.

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Disclaimer

The views expressed in this study are those of the author and do not reflect the official policy or position of Naval Medical Center San Diego, the Department of the Navy, the Department of the Army, Department of Defense (DoD), or the United States Government.

Statement of Ethical Conduct in Research

Patient confidentiality was strictly adhered to during this research study. All patients' medical information was protected at all times and under no circumstances will be discussed or released to any outside agency.

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Introduction

Naval Medical Center, San Diego (NMCS D) and its predecessors have played a vital historical role in San Diego since before World War I. In 1914, the United States Marine Corps' Fourth Regiment moved with its field hospital, from North Island to Balboa Park and remained there until 1917, when due to the advent of World War I, the Navy and the City of San Diego decided to establish a permanent Naval presence in the park. On May 23, 1917, Assistant Surgeon Alma C. Smith reported to Balboa on orders from Secretary of the Navy Josephus Daniels to open the doors to the War Dispensary. On May 20, 1919, the Dispensary was designated by Secretary Daniels as United States Naval Hospital, San Diego, and Captain M.D. Curl, MC, USN became its first Medical Officer in Command. The first permanent structure, constructed across the street from the park, was commissioned on August 22, 1922, and the equipment from what had been the War Dispensary was moved to that site to establish the hospital that would become affectionately known by its nickname of Balboa ("A History," 1988).

Over the years, the size of the facility grew and patient loads fluctuated as a result of military conflicts. During World War II, approximately 172,000 patients were treated; on December 27, 1944, the patient census reached 12,068 (NMCSR, 1988). Ninety thousand patients were treated during the Korean conflict. In 1969, when Balboa had more than 2,500 beds, the daily census averaged 2,100 patients of which 300 were casualties from Vietnam (NMCSR).

Today, the newest existing facility, opened on January 23, 1988, is the world's largest military hospital and the Navy's most technologically advanced. This high-tech, ultra modern facility is located in Florida Canyon and occupies a 70-acre site adjacent to Balboa Park,

approximately two miles northeast of downtown San Diego. NMCSO is a tertiary hospital accredited by the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO). The complex occupies nearly two million square feet of space and contains 240 acute care and 200 light care beds. Its average daily census is around 230 patients with a monthly average of 60,000 outpatient visits. With a staff comprised of approximately 6,000 military and civilians, NMCSO provides care to approximately half a million active duty, retired, and family member eligible beneficiaries.

Naval Medical Center San Diego operates a network of eleven clinics located at area military installations that provide ambulatory care to the active duty population, retirees, and their respective family members. The staff is augmented and the scope of services expanded through many innovative partnerships and resource sharing programs with civilian providers. In direct support of operational forces, NMCSO has five medical mobilization teams, including the USNS Mercy, whose personnel are drawn from hospital staff. These teams deploy to the Western Pacific and Southeast Asia at various times during the year, and as necessary to support operational forces. NMCSO's operational mission is to ensure Sailors and Marines have access to quality medical care, wherever needed (NMCSO, 2004).

Known as the "Pride of Navy Medicine", NMCSO is the most active teaching hospital in the Navy and is a leader in the medical field as a major teaching and research center. A Uniform Services University of Health Sciences (USUHS) affiliated facility, NMCSO is home to numerous residency and fellowship programs. NMCSO conducts graduate medical education programs in twenty-five specialties to include: anesthesiology, cardiology, dermatology, emergency medicine, gastroenterology, and general surgery. It also offers fellowships in nineteen specialties such as: adolescent medicine, critical care, computerized tomography and imaging,

dermatology, emergency medicine, hematology- oncology, internal medicine, obstetrics- gynecology, and orthopedics (NMCSO, 2004). NMCSO is affiliated with Scripps Clinic and Research Foundation, La Jolla, the University of California San Diego, Children's Hospital and Health Center, as well many other prestigious institutions throughout the United States where Navy trainees perform rotations as integral parts of fellowship programs (NMCSO, 2004).

Though NMCSO has seen numerous changes over the years, its mission has remained constant; provide the finest medicine in a family-centered care environment to the operational forces, their families, and to those who served their country in the past (NMCSO, 2004). In continuing this mission, history has shown NMCSO is no stranger to being a leading change agent. In keeping with its long tradition of leading change, in 2004 NMCSO sought to further improve the quality of care for its cancer patient population by integrating the services it provided them into a comprehensive cancer center (CCC). The command succeeded in creating a solid foundation for a CCC by consolidating services into one area. This was a Military Health System (MHS) ground-breaking endeavor, since prior to this no true form of CCC existed in the MHS.

Purpose

The purpose of this study is to provide a historical overview of the development of NMCSO's CCC. In addition, the study evaluated the current resulting services provided by the CCC using the CCM as a comparative tool for determining strengths and weaknesses and provides recommendations for improvement where warranted.

Conditions That Prompted the Study

The adult cancer care provided at NMCSO had historically been rather fragmented (Reyco, 2004). This issue was initially discussed at NMCSO's Oncology Advisory Group

meeting in July 2004. The NMCSO Oncology Advisory Group was comprised of physician and non-physician personnel having cancer patient related expertise or special interests. The group met quarterly and oversaw cancer activities in the hospital (Mateczun, 2004). Consensus was that there was no established, consistent standard of care across the various disciplines of the NMCSO Oncology service line (Reyes, 2004). At the time, the Oncology service line included: Hematology-Oncology (Hem-Onc), Radiation Oncology, Breast Health Center (BHC), Gynecology-Oncology (Gyn-Onc), Neurosurgery, Ear, Nose, and Throat (ENT) Clinic, Urology Clinic, Internal Medicine, General Surgery, Nursing Services, and Ancillary Services. While each of these areas played significant roles in treating cancer, the majority of outpatient cancer care was provided in three separate areas of the hospital: BHC, Hem-Onc Clinic, and Gyn-Onc Clinic. Each of these areas was under the management of a different directorate and each had its own separate operating procedures. Due in part to the fragmented delivery of cancer care, the level and quality of service appeared to differ significantly between clinics (see Figure 1).

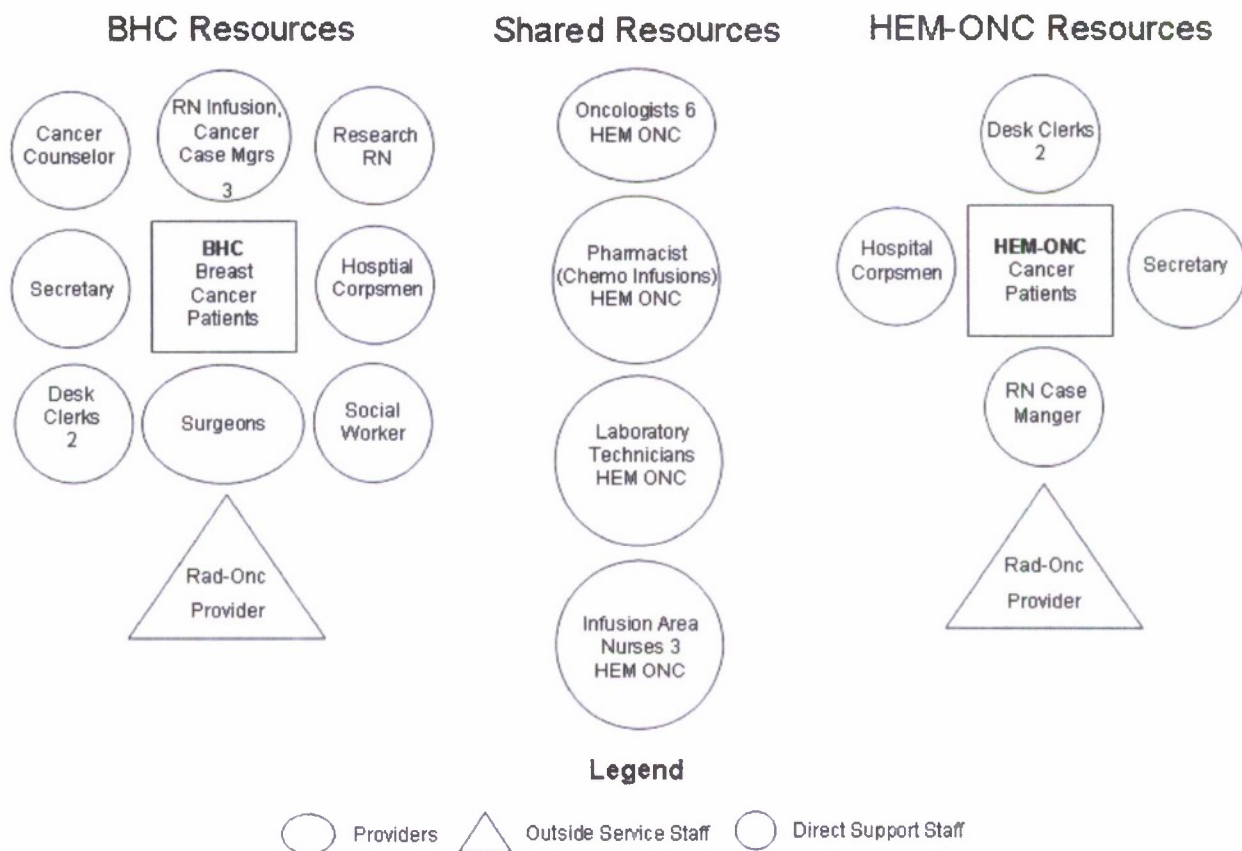
Figure 1. Comparison of available cancer support services as of May 2005.

Services	BHC	Gyn-Onc / Urology / ENT	Hem-Onc
On-Site Pharmacy			X
On-Site Laboratory			X
On-Site Chemo Inf.			X
RN Case Management	X		
On-Site Physical Therapy	X		
Social Worker	X		
Cancer Counselor	X		
Support Groups	X		X
Clinical Trials	X	X	X

Treatment areas had several things in common. Each clinic received patients through a referral system. Referred patients were triaged and contacted to schedule initial appointments. During an initial appointment, the patient was seen by a specialist for his/her possible or

confirmed hematology or oncology related condition, and any additional diagnostic testing was scheduled. As appropriate, the attending physician would consult with other physicians, as well as the patient and or the patient's family, and if necessary, initiate a treatment regime. In addition, each clinic offered patients the opportunity to participate in clinical trials. With the exception of one clinic, the Breast Health Center (BHC), which will be discussed later, care provided in these areas appeared more provider focused (Reyes, 2004). The differences between clinics, in particularly Hem-Onc and the BHC were greater than their similarities (see Figure 2).

Figure 2. Human resources for each clinic before creation of the CCC as of October 2005.



The Hem-Onc Clinic was located on the second deck of Building 2 and was part of the Directorate for Medical Services. In this clinic, five medical oncologists provided patients with hematology and oncology evaluations and treatment recommendations; all second opinions or additional referrals were conducted in other areas in the command (Reyes, 2004). The clinic had

a dedicated satellite pharmacy staffed by a part-time pharmacist who prepared chemotherapy solutions onsite, and four registered nurses (RNs) who provided onsite chemotherapy infusions (Reyes, 2004). Initially, three RNs performed this function; however, they gained another RN from the BHC when the BHC lost its funding and could no longer support giving patients onsite infusions. The pharmacy used Intellidose software to standardize chemotherapy orders. Intellidose, a cancer tracking program, automated dosage calculations for chemotherapy solutions and minimized potential miscalculations. Additionally, they had their own satellite laboratory to expedite lab sample collections and turn-around time for results. A part-time RN case manager from Utilization Review Department was on-call to assist the clinic with complex patient issues; however, not all patients had a case manager. All patients received education from the staff regarding their diagnoses and treatment; yet, resources were limited compared to those of the BHC.

The BHC was located on the second deck of Building 1 and was part of the Directorate of Ancillary Services. Established in 1997, the BHC had become known in the command as a Center of Excellence. The reason was that the BHC had historically provided the gold standard of cancer care, which was a multidisciplinary, comprehensive team approach to cancer treatment that offers patients one-stop shopping (Reyes, 2004). Over all, the service closely followed a patient-centered care model. During patients' appointments, virtually every service required was brought to them: all BHC patients were assigned an RN case manager to coordinate care; Hem-Onc, Radiation-Oncology, General Surgery physicians, and physical therapists visited the clinic to provide patient care, not the other way around; and BHC patients received significant education on their diagnosis, social service assistance, as well as psychological, spiritual, and dietary counseling in one location (Reyes, 2004).

The BHC also offered support groups and family counseling. Most appointments were clustered, and patients rarely had to leave the clinic for care; however, there were some exceptions to this. Plastic surgery consultations and radiation treatments were performed outside the clinic. In addition, lab and pharmacy services were provided by utilizing the satellite laboratory and pharmacy located in the Hem-Onc Clinic. Previously, three RNs administered chemotherapy onsite; though, as of January 2005, all adult chemotherapy infusions were performed in the Hem-Onc infusion area.

The Gyn-Onc Clinic was located on the first deck of Building 4 and was part of the Directorate for Surgical Services. Laboratory specimens were collected and analyzed in the Main Laboratory and chemotherapy solutions were prepared in the Main Pharmacy; both of these situations created potential treatment delays, especially in the case of the Main Pharmacy. Unlike the Hem-Onc Clinic and BHC, this clinic did not use a consistent chemotherapy order format (i.e., Intellidose), which created a potential safety issue (Reyes, 2004). Rather, the clinic provided chemotherapy infusion treatment via a separate Ambulatory Infusion Center located on the fifth deck of Building 1. In comparison to the aforementioned clinics, the Gyn-Onc Clinic offered virtually no patient education or other resources (Reyes, 2004).

Statement of the Problem

Under the previous organizational structure, which provided cancer care in series versus an integrated, coordinated, comprehensive, multidisciplinary team, and patient-centered structure, the primary care centers of NMCS D's cancer service line were missing opportunities to provide optimal care to a greater number of cancer patients. NMCS D decided to consolidate many of the resources for its cancer care services into a small CCC. Many decisions that made the consolidation possible were based on a thorough literature review and observations of what

local cancer centers were doing for their patients. Intuitively, the changes that were made would provide better services for NMCS D's cancer patient population. The literature review that follows supports the reasoning for the development of a CCC; however, questions remained regarding whether or not efficiencies were gained as a result of the CCC's development. The purpose of this study, therefore, was to evaluate key components that guided the development of a CCC and to determine what if any efficiencies were gained as a result of implementation.

Literature Review

Cancer affects everyone. Most people know of someone who either has, or had, some form of it or died from it, whether it was a family member, a friend, or acquaintance. The statistics are staggering. Worldwide, cancer currently causes 12% of all deaths, which are about 6 million deaths annually (WHO, 2002). The World Health Organization (2002) estimates that in approximately 20 years that number will increase to about 10 million. The WHO also estimates that compared to the nearly 20 million people alive with cancer today, the number will probably increase to more than 30 million by the year 2020 (WHO). Several principal factors contribute to projected increases: a worldwide increase in the proportion of elderly people combined with the fact that cancer occurs more frequently in that population compared to the young; an overall decrease in deaths from communicable diseases; and a rising incidence of certain forms of cancer such as lung cancer from the use of tobacco (WHO). Yet, the impact of cancer is far more complex than a simple look at the number of cases. In many ways, cancer may be equally, if not more distressing for the families of patients as well. The daily functioning and economic situation of cancer patient families may be profoundly affected, due in part to the economic consequences, such as loss of income and the expenses associated with health care (WHO).

In the United States alone, there are more than nine million people living with a history of cancer, and approximately 1,368,030 Americans will be diagnosed with cancer this year (NCAA, 2004). In 2001, the American Cancer Society (2004) ranked cancer as the second leading cause of death in the United States. Cancer accounted for 553,768, or 23% of all deaths, which was only second to the 700,142, or 29% of deaths attributed to heart diseases (ACS, 2004). The 2004 estimate for cancer deaths is currently 563,700; 290,890 men and 272,810 women (ACS). Lung cancer is the most fatal cancer for both sexes with 32% for men and 25% for women. In men, prostate cancer ranks second with 10%, and in women, breast cancer ranks second with 15% (ACS). Colon and rectal cancers rank third for both sexes with 10%. Men, as a whole, have a lifetime probability of 1 in 2 for developing some kind of cancer, a 1 in 6 risk of developing prostate cancer, and a 1 in 13 chance of developing lung cancer. For all women, the lifetime probability of developing some form of cancer is 1 in 3 with a 1 in 7 risk of developing breast cancer and a 1 in 17 lung cancer (ACS).

Although research indicates a small decrease in the incidence of cancer, over the next few decades the numbers of newly diagnosed cancers are expected to rise (ACS, 2004). The main reason for the projected increase has to do with age. According to the National Comprehensive Cancer Network (NCCN), "More than 50% of all new cancers in the United States occur in patients who are 65 years or older...cancer is the leading cause of death in women and men age 60 to 70 years" (NCCN, 2004, p. MS-1). By 2011, the last of the Baby Boomers will reach age 65, and the NCCN estimates, "...by 2030, 20% of the U.S. population will be 65 years or older" (NCCN, p. M-1). The NCCN also indicates, "The increased incidence and prevalence of cancer in elderly people and the increased lifespan of the elderly mean that cancer in older individuals is

becoming an increasingly common problem” (NCCN, p. MS-1). In essence, the demand for cancer care services will continue to rise.

With the rise in demand for cancer care services will come a greater demand for specific services or quality indicators from the cancer patient population. One company that has researched this issue is The Advisory Board Company (ABC). This company’s membership consists of 2,000 of the largest and most progressive health systems and medical centers in the United States (Roswell, 2004). The ABC publishes 50 major studies and more than 3,000 customer research briefs each year on progressive management and clinical practices in health care (ABC, 2004). One branch of the ABC, The Oncology Roundtable, serves the clinical and administrative cancer programs throughout the United States. Its research focuses on identifying and assessing the most important clinical and management practices in cancer care (Roswell, 2004). In a recent survey conducted by the Oncology Roundtable, patients indicated that they want centers of excellence (Oncology Roundtable, 2004). Centers of Excellence, like the NMCS D BHC, are synonymous with CCCs, which use a multidisciplinary team approach with one-stop shopping for patients. In addition to state-of-the-art technology and well regarded physicians, 92% of cancer patients surveyed want multidisciplinary care. Other findings of the Oncology Roundtable (2004) survey included: 88% of patients want psychosocial care; 86% want a patient-friendly facility; 85% want patient education information; 80% want clinical research trials; and 79% want end-of-life palliative care to be included as part of a CCC.

Physicians have also endorsed multidisciplinary care. In 1999, the American Federation of Clinical Oncologic Societies was already endorsing the implementation of multidisciplinary teams. In a consensus statement, they stated, "...to achieve optimum outcomes, most cancer care delivery should be planned and coordinated by a multidisciplinary team of oncologic health care

professionals" (Parry et al., 1999, p.1). In addition, they felt that providing patients access to a multidisciplinary team of cancer providers should "...span the full continuum of care, including prevention, early detection, staging evaluation, initial and subsequent treatment, long-term follow-up, palliative and hospice care, and supportive psychosocial services" (Parry et al., 1999, p.1).

Cancer patients, seeking such services in their treatment facilities, exhibit several characteristics, or symptoms, unique to their population that must be considered when caring for them. The most common symptoms are pain, distress, and cancer-related fatigue (NCCN, 2004). Each of these symptoms can be singularly debilitating; however, many cancer patients must cope with all of them at once.

One of the most feared, and a common symptom associated with cancer, is pain. The NCCN reports that pain occurs in approximately one quarter of newly diagnosed cancer patients, one third of those undergoing treatment, and three quarters of patients with advanced cancer. The treating of pain is fundamental to treating the whole patient. Intuitively, patients in pain are uncomfortable, less active, less motivated, and have a reduced quality of life. In accordance with the World Health Organization's algorithm for the treatment of cancer pain, patients are first treated with acetaminophen or a non-steroidal anti-inflammatory drug. If initial pain control is not effective, patients are then treated with mild opioids (codeine) and, if necessary, stronger opioids (NCCN, 2004). Along with medication, environment may also affect pain management. A study conducted by the Oncology Roundtable (2004) found that sickle-cell anemia patients required 53% less pain medication when treated in a home-like environment.

Distress is also an important factor to consider when treating cancer patients. The NCCN (2004) indicates that, between 20% and 40% of cancer patients have a significant amount of

stress; however, less than 10% of them are referred for psychosocial assistance. The NCCN cites two reasons in particular for the under treatment of distress in cancer patients. Because of the stigmatizing affects of the words psychiatric, psychosocial, and emotional, many patients are reluctant to disclose their distress. Furthermore, physicians, under pressure to keep patient visit times within industry standards (i.e., 15 minutes), often feel rushed, and simply fail to ask patients about psychosocial concerns (NCCN).

Understanding that cancer patients often experience distress is important because a failure to recognize and treat distress may negatively affect their entire regimen of care and ultimately the ability to heal. At a minimum, distress negatively influences the patients' quality of life; however, it can affect far more. Unrecognized and untreated distress may lead to patients making extra visits to the doctors' offices and/or emergency rooms. Distress may impair judgment and the ability to follow a treatment plan. In addition, it can negatively impact patients' relationships with friends, family, physicians, and cancer treatment teams. While no minimum standards for psychosocial care exist, the NCCN's Distress Management Guidelines recommend that all newly diagnosed cancer patients be rapidly assessed for evidence of distress using a brief screening tool. The NCCN (2004) uses a tool called the Distress Thermometer and Problem List to determine the need for further evaluation and referral to psychosocial services. Ultimately, each institution should develop a distress evaluation tool that fits the culture and standards of the health care organization and ensures all patients are screened to determine the need for psychosocial services.

The NCCN defines cancer-related fatigue as "a persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning" (2004, p. MS-1). Nearly all (70-100%) patients receiving radiation therapy, cytotoxic chemotherapy, bone marrow

transplant, or biological response modifier treatments experience fatigue. Of all of the symptoms associated with cancer and its treatments, many patients believe fatigue to be the most distressing (NCCN, 2004).

Cancer Centers

In the United States, the term cancer center describes a wide variety of organizations. A cancer center may even refer to an area in a medical facility that is designated as an outpatient clinic for seeing cancer patients. The term cancer center may refer to academic centers where education, training, and basic and clinical research are conducted as well as perhaps some clinical function. The center may conduct research only with no clinical function such as the Salk Institute in La Jolla, CA and the American Health Foundation in New York City (Simone, 2002). Simone defines cancer center as “a formal organization of diverse and complementary specialists who work on the cancer problem together and simultaneously rather than serially” (p. 1).

The most well-known cancer centers are those of the National Cancer Institute’s (NCI) Cancer Centers Program, which is comprised of more than 50 NCI-designated cancer centers. They engage in multidisciplinary research to fight against the incidence, morbidity, and mortality of cancer. The program includes three types of centers that receive support grants: Comprehensive Cancer Centers, Clinical Cancer Centers, and Cancer Centers. Comprehensive Cancer Centers conduct programs in basic, clinical, and prevention and control research in addition to programs in community outreach and education (NCI, 2004). Clinical Cancer centers primarily conduct programs in clinical research, and may have programs in other research areas. Cancer Centers, which used to be known as Basic Science Cancer Centers, focus on basic or cancer control research; however, they do not include clinical oncology programs.

Established after the National Cancer Act of 1971, the NCI-designated comprehensive cancer centers were considered to be national leaders in cancer research, education, and treatment (NCI, 2004). While many NCI designated centers provide outstanding care, the NCI designation does not automatically mean that a center indeed delivers high quality cancer care (Simone, 2002). That is because the NCI awards its designation based on an activity's support of research activities and is not designed to evaluate quality of care. Further, cancer centers should provide patients with a broader range of services (Simone). The WHO, in its discussion on managing national cancer control programs, cites a "...lack of a comprehensive, systematic approach, weaknesses in organization and priority-setting, and inefficient use of resources" (WHO, 2002, p. 5) as obstacles to creating and maintaining effective programs.

The WHO (2002) recommends several approaches that could easily be applied at a local level. In particular, it believes that cancer treatment should be approached comprehensively where interrelated key components in the different levels of care that share the same goal integrate instead of operating in vertical programs isolated from other related components. The WHO points to certain key processes that may facilitate the creation of a comprehensive cancer center (Center of Excellence). Based on the axiom that success breeds success, they advise starting small in order to give the organization a better chance at success, specifically by creating a pilot program to demonstrate the possibilities of integrated care. After, they recommend proceeding in a series of stages with clear measurable objectives that represent the basis for the development of the next stage to permit visible, controlled progress (WHO). Perhaps most importantly, they encourage the involvement of decision-makers and operational staff from various levels of care at every stage (WHO). Inclusion will facilitate communication of concerns from all stakeholders, which can help ensure the project stays on target.

In its 2001 report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, which many consider a landmark report about the condition of the U.S. health care system, the IOM made numerous recommendations to health care organizations to improve in areas of care where the system is considered weak. Some of their specific recommendations included providing care that is: safe, effective, timely, efficient, equitable, and patient centered (IOM, 2001).

The IOM (2001) defined effective care as knowledge-based care provided to everyone who could benefit, and withheld from those who cannot. In other words, health care organizations should avoid underuse and overuse of care. Timely care refers to reducing wait times and delays, not only for the patients but for care givers as well, a concept that ties in with the recommendation for efficiency, referring to the avoidance of waste of any kind of resource (i.e., energy, supplies, equipment, ideas, time, etc.). Time and energy, in particular, are resources worthy of singling-out in the case of efficiency because they are somewhat intangible. The IOM refers to equity as “providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status” (2001, p. 6). Patient-centered care is mentioned often in health services advertising, but simply promoting an idea does not necessarily mean that an organization truly practices it. The IOM (2001) defines patient-centered care as, “providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions” (p. 6). Dr. Edward H. Wagner, MD, MPH, a professor of Health Services at the University of Washington and creator of the Chronic Care Model (CCM), considers patient-centered care as one of the three major building blocks of providing high quality care. The other two are evidence-based care and population-based care. Evidence-based care incorporates case

managed care. Population-based care is care that is planned and organized to reach an entire population, such as a cancer patient population, through proactive service and planned visits. Such methods help to ensure patients do not get lost in the shuffle (Wagner, 2004b). The IOM (2001) believes that a health care system capable of making significant gains in these areas would not only be better at meeting its patient needs, but it would be better for clinicians and other staff as well, because they would “experience the satisfaction of providing care that was more reliable, more responsive to patients, and more coordinated than is the case today” (p.6).

The Chronic Care Model

The Washington State Health Department’s (2005) Web site summarizes the CCM as, “An organizational approach to caring for people with chronic disease in a primary care setting. The system is population-based and creates practical, supportive, evidenced-based interactions between an informed, activated patient and a prepared, proactive practice team. The Chronic Care Model emphasizes evidence-based, planned, integrated collaborative care.”

The development of the CCM was initiated when Dr. Wagner formed a study group in 1993 that, with support from the Robert Wood Johnson Foundation (RWJF), studied 72 designated best practices to see what they were doing to be successful, and if what they were doing coincided with the CCM. Not surprisingly, these practices were following the best practices as described in the CCM. The RWJF then funded the MacColl Institute to test the model nationally in various health care settings. The national program is called “Improving Chronic Illness Care” (Wagner, 2004a).

According to Dr. Wagner, the CCM was created out of a need to improve the quality of health care delivery. Many of Dr. Wagner’s ideas and comments on the state of our health care system reflect the kind of findings and recommendations found in the IOM’s *Quality Chasm*

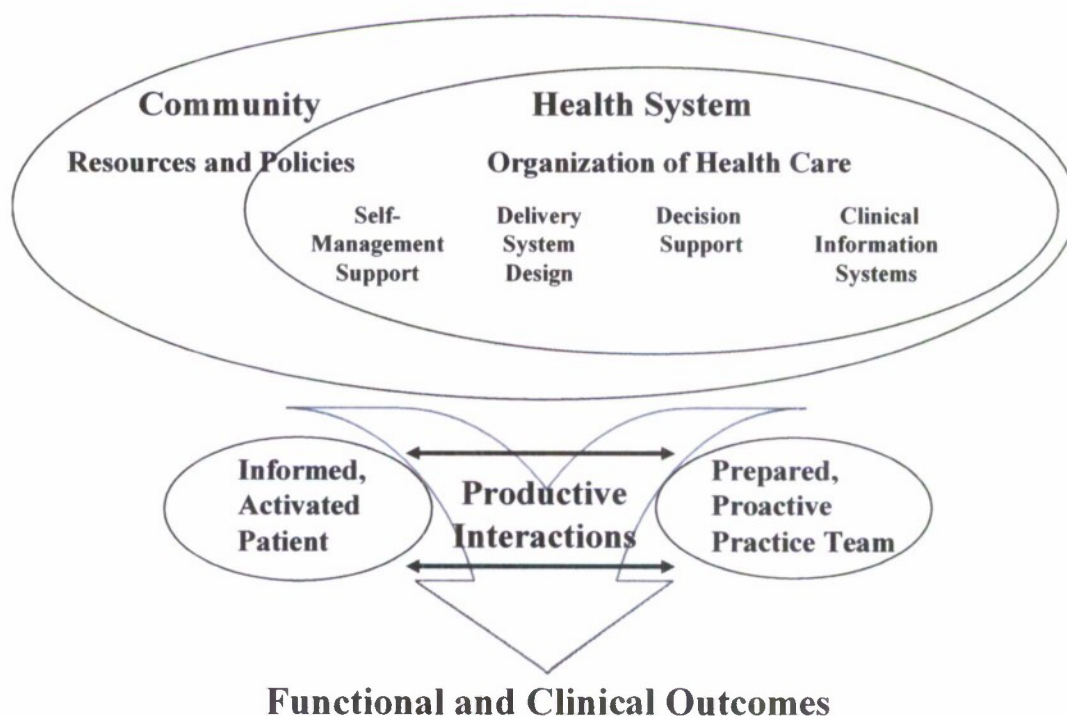
report. More than 100 million Americans suffer from one or more chronic illnesses and 40 million are limited by them (Wagner, 2004a). Though we spend approximately one trillion a year and have made significant advances in health care for these patients, over half of them still do not receive appropriate care. However, if best practices were better implemented, industry could avoid nearly 41 million sick days and more than eleven billion dollars in annual lost productivity. While the data clearly defines problems in the system, patients do not need to see the data, as patients and their families recognize the problems associated with care (Wagner).

In creating the CCM, Dr. Wagner and his team wanted to produce a visual aid that would allow people to better understand the shift in thinking from quality being a people problem to quality being a system problem. They wanted to better synthesize and characterize the successful interventions in the existing, albeit elusive, literature. They also wanted to emphasize the commonalities of quality improvement conditions across the spectrum of chronic conditions. In other words, they wanted to convey what the data had already shown; what works for improving chronic care in one area works for another too (e.g., what works for diabetes also works for cancer).

The CCM, demonstrates the kind of care that must be provided. As a whole, the current system is still practicing acute care. Because of this, most patients are not adequately taught to care for their own illnesses. Therefore, the problem according to Dr. Wagner is that, "Too often, caring for chronic illness features an uninformed, passive patient interacting with an unprepared practice team, resulting in frustrating, inadequate encounters" (Neurath, 2002, p. 2). The CCM seeks to reverse this situation by creating informed patients who are actively involved in their care. The practice teams also need to be proactive and prepared to receive these patients. Both conditions must be met to facilitate productive appointment interactions.

Figure 3 depicts the CCM. The description of the model starts at the bottom, indicating that improved outcomes for individual chronically ill patients is the goal. In order to get there, the interface between patients and practice teams needs to change. This requires health system changes such as in clinical information systems, decision support, which is provider behavior change, delivery system design, and self-management support, which refers to patient directed items. That health system resides within the larger community. The inclusion of the community in the model illustrates the environment in which the health system resides. It also emphasizes the importance of the community and how critical its support and resources are to the patients and their families in the health system (Wagner, 2004a).

Figure 3. The Chronic Care Model.



Adapted from: Wagner E. (1998). Chronic disease management: What will it take to improve care for chronic illness? *Effective Clinical Practice*, 1, 2-4

Dr. Wagner and his colleagues specifically chose not to use the term 'productive visit' in the model. Instead, they chose to say productive interaction; this is because the interaction does not necessarily have to be an actual face-to-face visit. A productive interaction may be conducted via numerous other means, such as a phone call, email, or satellite clinic. The team avoided using the term 'visits' because, historically, counting numbers of visits has been used to measure productivity. Consequently, counting visits to measure productivity has distorted the notion of being productive, thus within the model, productive means, "the work of evidence-based chronic disease care gets done in a systematic way" and that "guideline care is rendered in a predictable way" (Wagner, 2004a, n.p.). Also, within the model, 'care' refers to clinical as well as behavioral treatment. Dr. Wagner describes a productive interaction as involving the following actions: the provider's assessment of the patient's self-management skills, confidence, and clinical status; tailoring of the patient's care by stepped protocol; collaborative goal setting and problem solving between the patient and the practice team; and active, sustained follow-up. If the interaction effectively meets those criteria, a productive interaction has occurred. In sum, the model represents a brief description of what modern self-management support is about. This is different from didactic patient education which has been shown time and again to be largely ineffective (Wagner, 2004a).

In order to reach productive interaction, patients must become more informed about their own chronic illness, and activated (motivated) to do what it takes to effectively make decisions about their health and how to best manage it. This shift represents a stark contrast to the uneducated, withdrawn patients of the old acute care model. The new model patient is activated, or empowered, to take part in self-management. Through self-management, the practice team emphasizes the central role of the patient and encourages his/her involvement in the process.

Current research indicates that in order to obtain optimal outcomes in most major chronic illnesses, practice teams must encourage the patients' ability and interest in managing their own conditions (Wagner, 2004a). Subsequently, the other half of the productive interaction equation is the prepared practice team. Prepared means the practice team is ready to provide modern chronic illness care. In other words, when the interaction occurs, they have the patient's information, decision support through evidence-based care models, and the necessary resources to deliver high quality care (Wagner). Delivery systems, therefore, must emphasize teamwork, planned interactions, and clinical case management. Teams are key, and that increased involvement of non-physician members of the practice team is crucial. This would include staff such as nurses, counselors, and hospital corpsmen. Team member roles need to be defined and tasks distributed amongst them. The bottom line lies with delegating certain critical duties to staff other than physicians to insure tasks are completed; one person cannot do it all (Wagner, 2004a).

Planned interactions should be used to support evidence-based care and help ensure a productive interaction. This involves shifting away from the traditional reactive acute visit to proactive planned visits. In addition, these visits involve more than just the physician; they involve all necessary team members (i.e., case manager, cancer counselor, social worker, pain management, etc.), include an agenda, and can be done individually or in groups depending on the nature of the care needed. This means maximizing the time for the patient and the health care delivery team and supports the following: "The structured or planned visit is at the heart of most successful chronic disease interventions" (Wagner, 2004a).

With regard to providing clinical case management, Dr. Wagner (2004a) indicates that patients with complex problems (i.e., chronic care patients) need more intensive monitoring than

a typical care team can provide. Therefore, the use of a clinical case manager, a nurse, pharmacist, or other person with clinical training, is needed; thus supporting evidence that proactively managed care results in better outcomes in these patients. The services provided by a clinical case manager are the same as those of a productive interaction, except they are more expressly tailored to patients with particular needs (Wagner, 2004a).

Decision support deals with four ideas that involve changing provider behavior: embedding evidence-based guidelines into daily clinical practice; integration of specialist expertise and primary care; using proven methods of educating providers; and open communication with the patients, which means sharing guidelines and information with them. In order for these guidelines to be effective, and research has shown they can be, they must become part of the daily practice of providing care (Wagner, 2004a). One example Dr. Wagner offers of an effectively integrated guideline is a point-of-service reminder such as having a patient's needed lab draw pop-up on the computer monitor when he/she checks into the clinic, instead of a practice team member having to manually research what is required. His recommendation to integrate specialist expertise and primary care is based on evidence that indicates chronic illness specialists are more apt to know about and practice evidence-based medicine and are more experienced with many of the complexities related to difficult chronic illnesses. Remaining unanswered, however, is the question: How do we perform this integration in a cost effective and practical manner? In order to more effectively educate providers, suggested is the use of more small-group, patient-oriented, problem-oriented, skill-based methods because research has shown such methods to be more effective (Wagner). As for sharing guidelines and information with patients, Dr. Wagner admits that the idea of doing so is just beginning to be researched. Yet,

he hypothesizes that sharing this information may encourage patients to become more frequent requesters of evidence-based medicine.

Clinical information systems are important to the model to help ensure productive interactions. An effective system need not be a full electronic medical record; however, most systems, such as that of the Military Healthcare System, will include some version thereof. Clinical information systems are effective tools for meeting several needs: providing reminders to patients and providers, facilitating patient care planning, sharing information between providers and patients, and monitoring performance metrics (Wagner, 2004a).

Health care systems must take advantage of community-based support systems and resources in order to enhance the quality of chronic care. Community support within the model is critical. Dr. Wagner (2004) notes, "Many important services and resources for patients with major chronic illnesses are not part of most medical systems" (n.p.). Included are services and resources such as exercise programs, nurse educators, dietitians, and peer support groups necessary to meet the needs of chronic care patients. This area of support is grossly under researched, but is increasingly important, as multispecialty care for chronically ill patients remains problematic.

The last part of the CCM addresses the health care organization and how it may act as a barrier or facilitator to improving chronic care delivery. The model recommends visible support for improvement at all levels beginning with senior leadership, promotion of effective improvement strategies, encouraging open communication, and systematic methods for dealing with problems. Likewise, the organization may act as a barrier if it promotes the wrong kinds of changes or provides incentives in the wrong areas. Dr. Wagner credits The Veterans' Administration Health Care System (VA) as being a role model for what an effective

organization is capable of achieving as indicated by the substantial improvements they have made in their organization (Wagner, 2004a). The VA is actually one of the largest and most successful examples with regard to implementation of the CCM. Though it had serious problems with complaints about the quality of its health care in the early 1990s, since adopting the CCM, the VA has not only improved perceptions of their care, "it regularly outscores private sector providers while reducing per patient health care costs by 25%" (Pennsylvania, 2008 p.5).

The CCM has further proven successful in its application as indicated in studies. A recently released report of the meta-analysis of 112 studies across four different chronic illnesses (27 asthma, 21 congestive heart failure, 33 depression, and 31 diabetes) found a 30-60% improvement in the process of care associated with CCM-like interventions with a 10-15% improvement in clinical outcomes across all of the studies (Wagner, 2004a). These findings are significant because they suggest to skeptics that requisite interventions have a measurable effect on the quality of care chronically ill patients receive. Also noted is that CCM-like interventions, more often than not, have had a positive impact on quality of care. In any case, there remains no one magic cure to fixing systems; single interventions have not made a significant difference. Instead, findings indicate that any given proposed intervention package seems to be more effective the more interventions were attempted. This suggests comprehensive changes to health care delivery are what make a difference. There are other advantages of implementing a general system change model such as the CCMs, which are applicable to most chronic care and preventive treatment modalities. In addition, once system changes are in place, implementing new guidelines is easier. Current users of the system are reporting minimal disruption to integrating this model across their various service lines (Wagner, 2004a).

The research on whether the CCM saves money is mixed. Most studies show that the CCM reduces health-care use or costs; however, there are some that do not (Neurath, 2002). Research has shown that the CCM can save on the cost of caring for patients with chronic health conditions such as asthma, diabetes, congestive heart disease, and hypertension. Achieving those savings, however, results in costs for additional labor, time, training and information systems. Because of this, some insurance companies are resistant to reimbursing for such care. Another problem lies in measuring savings resulting from chronic care. Some insurers are unwilling to pay today for a payoff that may not arrive until 10 years in the future.

Methods

Since NMCSO formed a special project team to evaluate the feasibility of creating a CCC, interviews with the Head Hem-Onc Nurse, who was a member of the team, and many of the team's findings were utilized to document the history of creating the CCC. The CCM was used as a comparative tool. Specifically, it was used to look for ways in which the new CCC sought to ensure productive interactions with their patients. Successful indications included whether the patients were informed and actively involved in their care, and if the care team sought to be proactive and prepared to receive their patients. Other characteristics of the model were used to examine other health system changes, such as: clinical information systems, decision support, delivery system design, and self-management support, as it applied to the CCM. Furthermore, the way in which the CCC included the patients' families in their care was examined. Lastly, though savings resulting from using the CCM were usually considered difficult to quantify, measurements were made using before and after comparisons of efficiencies in personnel management and the generation of relative value units (RVUs).

Data Collection/Sources

The data used in this study was secondary, as it was retrieved from various sources within the command. Data sources included the Composite Health Care System I (CHCS), and the Armed Forces Health Longitudinal Technology Application (AHLTA).

AHLTA, the primary medical documentation system for the Department of Defense, supplies automated medical information system support to all MTFs who provide comprehensive health care to some 8.7 million eligible beneficiaries. AHLTA functions include: patient administration; patient appointments and scheduling; managed care program; clinical; laboratory; radiology; pharmacy; dietetics; and medical records tracking. CHCS, the predecessor of AHLTA, was used along with AHLTA as another tool to analyze patient populations in individual clinics. These data systems provided clinical workload data and supporting information regarding the use of human resources.

Limitations

Secondary data sources, CHCS and AHLTA, were used. Though advantages included low cost, timeliness and impartiality of information, potential disadvantages remained. Data in each system was entered by hand and from various sources, thus the potential for human and system errors existed. For the purposes of this study, however, the data collected was considered valid and reliable, as it was subjected to review and confirmation by the NMCS D Directorate for Health Care Business staff, those who most often use the information for operational analyses.

Further, this analysis was described as an internal assessment of clinical operations within Naval Medical Center, San Diego. As a result, findings may be generalized only limitedly. With regard to assessment, internal application weighed more heavily, as supported by the following: "In evaluation and assessment research, findings are not intended to be externally

generalizable, rather they are limited to the environment for which the study is designed" (Guba & Lincoln, 1989).

Cancer Center Development

Over the past three years, the Hem-Onc department has undergone significant changes. Though not officially renamed a cancer center, the department is now by definition, a small cancer center. As originally envisioned, it has expanded services for more cancer patients through coordination with other areas. These expanded services are centralized within the Hem-Onc Department.

In January 2005, the Hem-Onc infusion area assumed responsibility for all adult cancer patient infusions; however, there were still two infusion areas in the hospital. One area, the Ambulatory Infusion Center (AIC), was located in one of the Command's nursing towers of Building 1 and the primary area, where chemotherapy infusions were administered, was located in the Hem-Onc spaces within Building 3. Both the need to expand the current chemotherapy infusion area due to its small size and the need to relocate AIC to make room for inpatient care led to initiatives to renovate the Hem-Onc Infusion area so it could accommodate co-locating the two services into the Hem-Onc area. The plans for this renovation, which would eventually become the core of the CCC, were developed by an NMCSO Executive Steering Committee (ESC)-chartered Cancer Center Tiger Team, who began meeting in January 2005. The team met two to four times monthly over the course of a year and consisted of Hem-Onc and BHC staff as well as other ad hoc members from various cancer care services within the command (i.e., Radiology-Oncology and General Surgery). After much debate on where the CCC would be located, which services it would include, and who would lead it, the team presented twice to the ESC. The first one was an update brief presented in May 2005, which due to much dissention

within the team, led to a revision of the charter to refocus the group on presenting a feasible plan for creating a CCC. The final presentation was a decision brief given in mid-December 2005.

The ESC agreed that creating the center and renovating the Hem-Onc infusion area would be a good idea; however, initially, the time for beginning the renovation was undetermined due to the need for identifying funding.

While waiting for funding to become available, Hem-Onc began incremental changes that would centralize the cancer care services they provided. During this transition period, most of which took place during 2006, Hem-Onc gained new cancer care support positions that had been previously located within the BHC, the result of a decision to have the BHC drop its cancer patient workload and concentrate on two core areas: disease prevention and detection as well as patient and provider education. In March 2006, Hem-Onc received a registered nurse case manager, cancer counselor, and social worker from the BHC. During this time, a new multidisciplinary Prostate Cancer Clinic was developed and implemented within Hem-Onc; all prostate cancer patients were then seen twice per month. By May 2006, the Hem-Onc providers stopped seeing breast cancer patients in the BHC and instead saw them in Hem-Onc. A second case manager was acquired from the BHC. In addition, expanded services gained in Hem-Onc included a dietitian and direct chaplain support. As of August 2006, all brain tumor patients were seen once per month in a new multidisciplinary Neuro-Oncology Clinic held in Hem-Onc. After each clinic, the providers from each respective clinic met to coordinate patient care. The Hem-Onc Department received productivity credit for all new clinics operating within their spaces. Furthermore, a Cancer Care Quality Team was created by the Population Health Department and a Cancer 101 Class was also developed. The 90-minute class was held twice per month to educate all patients regarding services available to them.

In the summer of 2005, mold was discovered in the nursing tower heating and air conditioning ducts where the AIC was located. While unfortunate, this ended-up helping to expedite construction of the Hem-Onc infusion area so that the AIC could be collocated there when the tower mold abatement project began. As a result, funding for the Hem-Onc infusion area was approved in March 2006 and renovations began in July 2006. In November 2006, the newly renovated and expanded Hem-Onc infusion area officially opened and began seeing all adult infusion patients for the command.

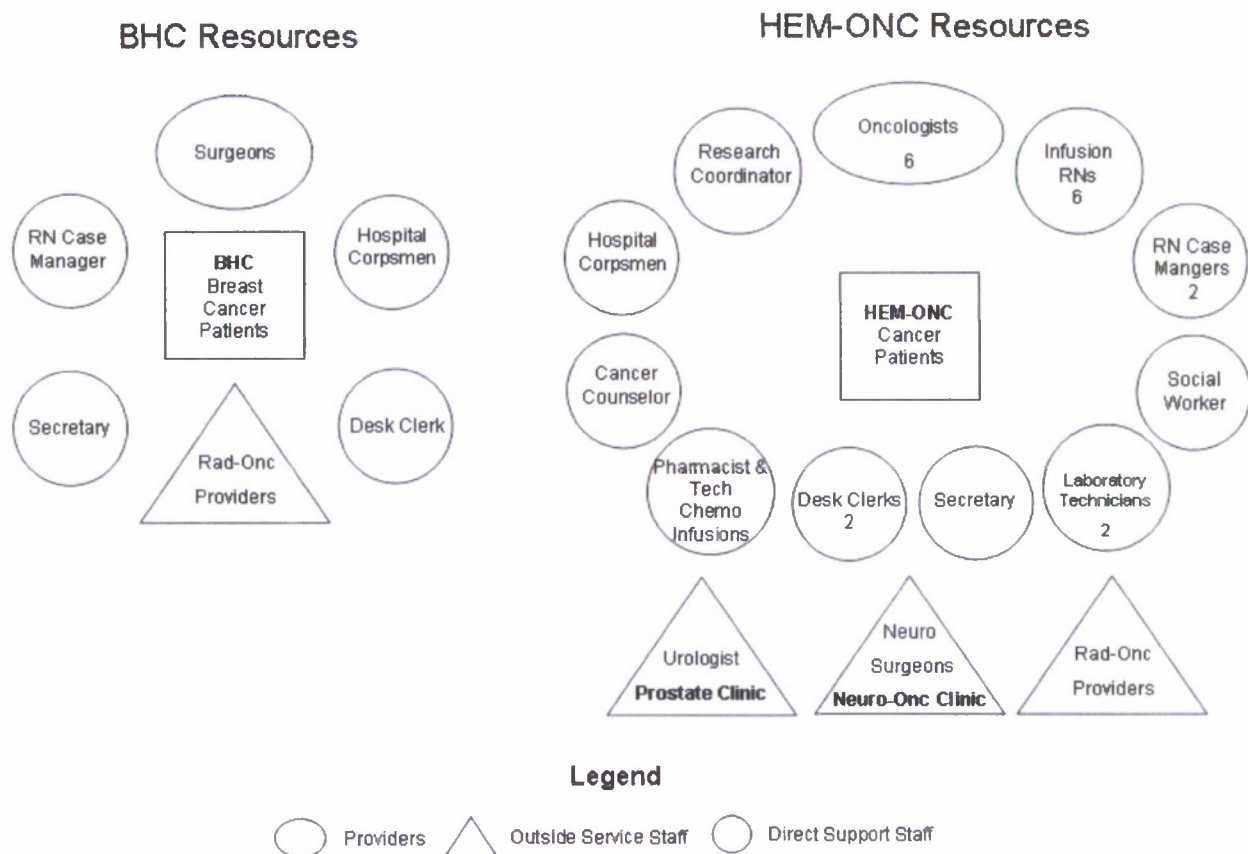
The opening of the new infusion center brought many benefits. It more than doubled the usable square footage for patient space to approximately 1,700 square feet. It doubled the number of patients from 8 to 16 who could receive infusions in that area, and added a private room with a bed for those with a need or desire to use it. Patients were no longer treated in a cramped area since the renovated area was now a very open space, tastefully decorated, and aesthetically pleasing with a less “clinical feel”. Furthermore, the new center eliminated confusion as to where patients needed to go for any infusion, and freed up limited inpatient space in the nursing tower.

Lab and pharmacy staff and leadership were involved from the beginning of the renovation project to ensure the new space designs would optimize efficiencies. The new onsite pharmacy doubled its usable space and became a true intravenous pharmacy, as all new required safety features were incorporated into its design. Features included improved ceilings, flooring, and access points. The new access point reduced foot traffic through the pharmacy; before, it was a thoroughfare and safety hazard. Though the lab actually lost floor space, it gained more efficient use of available space and was able to operate more effectively through design.

The opening of the new infusion center also signified the completion of needed staff

moves that would form the Cancer Center. Figure 4 depicts the final resulting distribution of staff between the BHC, where cancer patients are no longer seen, and Hem-Onc, which forms the core of the cancer center.

Figure 4. Human resources for each clinic after creation of the CCC as of April 2005.



Results

Using aspects of the CCM: Patient and Family Education and Involvement, Care Team Preparation, Information Systems, and Cost Savings, the CCC was evaluated to see how well it met the goals of the CCM. The following findings were noted.

Patient and Family Education and Involvement

The CCC successfully educates its patients and involves them in their own care in several ways. In addition to any education conducted during patient interactions, the CCC implemented

its Cancer 101 classes, offering them since August 2006. There were already more than 50 patients enrolled in the course as of October 2006. The course was not intended for patients alone; rather, the cancer center team believed that cancer was a diagnosis requiring family support. Families and/or close personal friends of patients, therefore, were strongly encouraged to attend the Cancer 101 course, thus joining the treatment process from the beginning (J. Reyes, personal communication, June 6, 2008).

The bimonthly course was taught by the cancer center team and focused on educating recently diagnosed cancer patients about the disease. Further, the course informed patients about the resources available: cancer counseling, oncology nutrition services, oncology nursing, and pastoral care. In addition to improving patients' response to surgery, radiation, and cancer drug therapies, cancer counseling familiarized patients in the use of survivor tools, to include stress reduction, guided imagery, and assertiveness training. Counselors also facilitated support group activities, individual, couple and/or family counseling sessions, and grief therapy. Oncology nutrition services were provided because cancer patients often required special dietary needs. Registered dietitians ensured patients received proper nutrition to complement the various types of cancer treatment received. This was important because patients' appetites declined as a result of treatment, and early nutrition intervention assisted cancer patients in maintaining healthy weight. Oncology nurses received comprehensive training in the care of cancer patients and proactive case management. They learned techniques for managing side effects, employing alternative therapies, obtaining information on clinical trials, and how to control symptoms, especially with regard to palliative care. Pastoral care was also incorporated to address spiritual and emotional support for cancer patients and their families (NMCSD, 2007).

The Cancer 101 course provided information regarding differences among various health care insurance policies (TRICARE, Medicare, and HMO/PPO insurance coverage, State of CA Disability Insurance, Social Security Disability and private disability insurance), advance directives, and other legal documents, such as durable medical powers of attorney, powers of attorney for finances, and wills. Servicemember's Group Life Insurance (SGLI) and Veterans Group Life Insurance (VGLI) as related to a cancer diagnosis were also discussed. Additional information provided to patients included: American Cancer Society programs for newly diagnosed cancer patients and families; community based resources for transportation, meals, and housing; the Exceptional Family Member Program (EFMP) for newly diagnosed cancer patients; and resources for hair loss due to chemotherapy or radiation treatments. Again, the patients' and family members' involvement in the treatment process was initiated through education; to this end, the course served as an introduction. Nurse case managers, cancer counselors, social workers, providers, and other team members remained actively engaged with patients to assist them with their needs (J. Reyes, personal communication, June 6, 2008).

Care Team Preparation

Aside from the traditional means of training, including continuing medical education and applicable licensing requirements for providers, nurses, and support staff, the cancer care team sought to be proactive in identifying and implementing advanced treatment methods. One method was the use of dedicated case managers who facilitated coordination of care. Assigned to each oncologist, case managers functioned as liaisons between patients and the team, serving as a centralized source of information and helping to reduce stress. This purposeful approach indicated a desire to efficiently direct the course of treatment rather than being reactive and disorganized. Co-locating infusion nurses from the AIC provided an additional opportunity to

leverage efficiencies; nurses were able to improve manpower distribution, benefitted from receiving similar training, and profited from streamlining treatment routines. Overall, continuity of care for patients utilizing the infusion center improved (J. Reyes, personal communication, June 6, 2008).

Information Systems

The cancer center sought to improve its use of clinical information systems, decision support tools, delivery system design, and self-management support, thus increasing the productivity yielded from patient interactions. With the full implementation of AHLTA, patients' records became fully electronic. As with any new system, however, there was a learning curve to overcome. As the use of AHLTA became the business standard, cancer center staff grew familiar with its features. Though AHLTA contained many useful attributes, missing was an inpatient care module and some communication and alert features that could facilitate better coordination of care, such as an automated email for admissions. When patients were admitted to the hospital, it was possible for the patient's primary care provider, in this case the oncologist, to be unaware of the admission. If upon admission an automated email could be sent to all providers and nurses currently seeing the patient, then the patient's continuity and quality of care could be better coordinated across teams. Likewise, the same principle could be applied to patients reporting to the Emergency Department (ED). If the primary providers for patients were notified upon arrival, perhaps patients could be intercepted, triaged, and diverted to appropriate clinics, assuming problems or concerns did not require emergency treatment (J. Reyes, personal communication, June 6, 2008).

Cost Savings

Cost savings resulting from using the CCM may be considered difficult to measure, and attempting to measure them for this model proved no less challenging. Even before beginning many of the transitions that led to the CCC, the Tiger Team and the ESC knew that these changes may not result in measurable cost savings; however, they also knew that many of the changes needed to be made because the command aspired to create a patient and family centered environment of care. As the CCM indicated, actual cost savings may take years to realize, and the total costs of NMCSO's cancer center development have not been fully calculated.

An analysis of fiscal year workload data for all cancer center staff between 2005 and 2007 suggested that the cancer center saw approximately 2,500 more encounters than in 2005, an 18% increase. The same data also suggested that the RVUs generated for the respective encounters increased 30%. The increase in encounters may be attributed to several factors; however, improvements most likely result from realigning BHC, prostate, and neurology patients with the cancer center, along with the additional encounters gained from Cancer 101 courses held in the center. Productivity increases may also have been attributed to the command's initiative to enroll the over 65-year-old patients for its Graduate Medical Education Program, and an overall increase in the incidence of cancer for the region. The boost in RVUs also correlated with increases in encounters; though, data quality from information collected in 2005 (when AHLTA was implemented command-wide) may have been compromised. Numerous problems, such as learning curve and AHLTA system errors, were assumed to have negatively impacted productivity, measured in RVUs. Therefore, any increase in RVUs could be attributed to staff familiarity with AHLTA since its 2005 inception and subsequent coding improvements.

Through a reorganization of the BHC, some command costs were avoided by the elimination of contract positions no longer necessary. For cancer care, the amount of manpower stayed essentially the same and the reallocation of resources to the center greater efficiencies by being centrally located. As a result, the money spent to pay for manpower was better utilized because more cancer patients were being served per support resource. This efficiency may be illustrated by comparing the workload captured for the cancer counselor and social worker, initially part of the BHC, but a shared resource with Hem-Onc. As of the first quarter, calendar year 2005, data obtained from CHCS suggested that the cancer counselor workload for Hem-Onc was only 34 visits less than the number of BHC visits and the social worker's workload was only 72 visits less than the BHC. The difference was significant in terms of utilization when considering that Hem-Onc workload was based on these resources spending one day per week in Hem-Onc, with BHC data based on four days per week. Since resources were available to see all cancer patients in the cancer center five days per week, including those not previously seen in Hem-Onc (i.e., gynecology-oncology, urology, neurology, etc.) efficiencies were gained by virtue of economies of scale (J. Reyes, personal communication, June 6, 2008). Confirmation of improvements would require further detailed analysis of the population being seen in the cancer center, however.

Conclusion

As evidenced by the many programs created and the CCM-like model currently utilized, NMCSO has made tremendous progress in developing its cancer center to provide comprehensive care. Most of what should be done has already been accomplished in the areas of patient/family education and involvement, and care team preparation. An additional recommendation with regard to the cancer care program may be the inclusion of a Cancer 201

course, as suggested by the Population Health Department. Such a program is considered to add value, and patient demand supports it.

As for information systems, any needed specialty modules (i.e., inpatient care) should be created within AHLTA. Beneficial features would include the development of alerts in AHLTA to facilitate communication between inpatient, outpatient, and ED care teams to help ensure providers are aware of patients' status, facilitating better continuity of care. Periodic training in coding procedures as well as error prevention and resolution for cancer center providers would help ensure correct utilization of and familiarity with coding templates that maximize RVU capture while minimizing the time it takes to actually code visits. Coding auditors from the Patient Administration Department have been made available and are willing to help in this effort.

The CCC at NMCS D demonstrates the successful implementation of a comprehensive cancer center proficient in streamlining processes and capable of increasing quality and access to care through the use of a patient/family-centered model. Though data interpretation may be inconclusive at this time, it is assumed that command resources are more efficiently utilized, thus improving productivity. More importantly, under the revised system of delivering cancer care at NMCS D, the command met its goal of providing comprehensive, multiservice cancer care. This care allows more patients to receive supplementary cancer services within a single location, resulting in a better system for the cancer patient population than was previously possible.

References

- A history of Balboa hospital. (1988, January 23) *The Dry Dock*, p. 3, 4.
- Advisory Board Company. (2004). In Brief. Retrieved October 5, 2004 from <http://www.advisoryboardcompany.com/public/inbrief.asp>
- American Cancer Society (2004). *Cancer Statistics Presentation 2004*. Retrieved September 17, 2004, from http://www.cancer.org/docroot/pro/content/pro_1_1_Cancer_Statistics_2004_presentation.asp
- Clinical Information Technology Program Office. (2003). *Overview of CHCS*. Retrieved October 13, 2004, from <http://www.citpo.ha.osd.mil>
- Guba, E., & Lincoln, Y. S. (1989). *Fourth Generation Evaluation*. Newbury Park, CA: Sage Publications.
- Institute of Medicine (IOM). (2001). *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press
- Mateczun, J.M. (2004). Naval Medical Command San Diego Instruction 5420.16B. (Available from Naval Medical Center, 34800 Bob Wilson Drive, San Diego, CA 92134)
- National Comprehensive Cancer Network. (2004). Clinical Practice Guidelines in Oncology (Version 1.2004) [Computer software].
- Naval Medical Center San Diego. (2004). *Naval Medical Center Web Site*. Retrieved September 25, 2004, from <http://www.nmcscd.med.navy.mil>
- Naval Medical Center San Diego. (2006). *"Cancer 101"* (1st ed.) [Brochure]. San Diego, CA: Reyes.
- Naval Medical Command Southwest Region. (1988). Welcome to the new Naval Hospital San Diego [Brochure].

National Cancer Institute. (2004). Cancer Facts: The National Cancer Institute Cancer Centers

Program. Retrieved October 1, 2004 from http://cis.nci.nih.gov/fact/1_2.htm

Navy Bureau of Medicine and Surgery (BUMED). Business Case Analysis Planning Tool.

Retrieved April 1, 2005 from

<https://navymedicine.med.navy.mil/default.cfm?seltab=bumed&ecmid=93E9008D-802E-D019-ABBA0925B2764081&docid=11750>

Neurath, P., (2002). Chronic gain: Docs and insurers wrestle with new approach [Electronic version]. Puget Sound Business Journal, November, 1-4. Retrieved April 23, 2005 from: <http://www.bizjournals.com/seattle/stories/2002/11/18/story3.html?>

Oncology Roundtable. (2004). Future of oncology: Strategic forecast and investment blueprint.

In Future of cancer care strategy: Charting a course for profitable growth. Symposium conducted at the Oncology Roundtable National Membership Meeting, Marina del Rey, CA.

Parry, E., Stevens, S., Gilliam, A., Horvath, N., el-Charif, M., Spiro, T., et al. (1999).

Management of cutaneous lymphomas using a multidisciplinary approach. *Archives of Dermatology*, 135(8), 907-911.

Pennsylvania Chronic Care Management, Reimbursement and Cost Reduction Commission.

(2008, February). *The Pennsylvania Chronic Care Management, Reimbursement and Cost Reduction Strategic Plan*. Retrieved April 9, 2008, from <http://www.rxforpa.com/assets/pdfs/ChronicCareCommissionReport.pdf>

Reyes, J. (2004, July). Naval Medical Center San Diego comprehensive cancer initiatives.

Presentation given at the NMCSO Oncology Advisory Group meeting, San Diego, CA.

Simone, J.V. (2002). Understanding Cancer Centers. *Journal of Clinical Oncology*, 20(23), 4503-4507.

- TRICARE. (2004). *New Choices in Cancer Care*. Retrieved October 10, 2004 from <http://www.tricare.osd.mil/cancertrials/>
- Wagner E. (1998). Chronic disease management: What will it take to improve care for chronic illness? *Effective Clinical Practice*, 1, 2-4.
- Wagner, E. (2004a). *Improving chronic illness care: Part 1 – improving care: The chronic care model*. [Online video]. Retrieved April 21, 2005 from <http://www.researchchannel.org/program/displayevent.asp?rid=2383>
- Wagner, E. (2004b). *Improving chronic illness care: part 3 – meeting the needs of patients with chronic conditions: Patient-centered care*. [Online video]. Retrieved April 21, 2005 from <http://www.researchchannel.org/program/displayevent.asp?rid=2385>
- Washington State Health Department (WSHD). (2005). *Washington state collaboratives*. Retrieved April 20, 2005 from <http://www.doh.wa.gov/CFH/WSC/info.htm>
- World Health Organization. (2002). *Executive summary: national cancer control programmes: Policies and managerial guidelines* (2nd ed.). Italy.